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NASA TECH BRIEF

Goddard Space Flight Center

Program for Improved Electrical Harness Documentation and Fabrication

The problem:

Subsequent to establishing the electrical harnessing requirements for the Nimbus Spacecraft, it was necessary to prepare a detailed system harness interconnection wiring table to identify and stipulate the requirements for each harness segment. The interconnection wiring table must (a) stipulate wire size and type, connector identification and type, pin identification, shielding, splicing and bussing requirements, special harness fabrication and test requirements, and (b) identify reciprocal pin/connector assignments for all wiring within a harness segment.

The solution:

A computer program provides an automated printout of the harness interconnection table and an automated cross-check of reciprocal pin/connector assignments, and improves the accuracy and reliability of the final documented data.

How it's done:

Developing the Harness Interconnection Table Program (HIT) to achieve the above purposes constituted the original concept of mechanization, and resulted in (a) eliminating the manual preparation of the interconnection wiring drawing, (b) eliminating the manual cross-check of reciprocal assignments by engineering personnel, and (c) employing a computerized error printout which permits identification and correction of errors to assure the accuracy of disseminated data and information.

Upon implementation and successful use of the HIT, two additional computer programs utilizing HIT as a basic source of wiring data and information were developed. The Harness Parts List Output Program (HPLO) provides an automated computer printout of the parts required for harness fabrication. The additional capability provided by this program eliminates the need for manual preparation of harness parts lists, improves the accuracy between interconnection tables and parts lists, and eliminates the previously required cross-checking of parts lists with interconnection tables. The Harness Cable Labeling Program (HCLP) provides a "wire identifiers" computer printout on self-adhesive tabs which can be quickly and easily applied as temporary wire markers during harness fabrication. This capability eliminates the need for manual preparation of the wire markers, as well as eliminating the possibility of intrinsic error through such manual preparation.

The Harness Master Tape Copy Program (HMTC) was developed to provide a means for copying and/or modifying the above three programs in order to incorporate revised requirements and information.

Notes:

1. All of the above computer programs and their corresponding library tapes have been successfully and continuously employed on Nimbus Spacecraft Programs. They have provided a fast, accurate, and improved means of documenting electrical harnessing requirements and information, facilitated harness fabrication, reduced manpower efforts of engineering and manufacturing personnel, and effected considerable cost savings.
2. The programs are written in FORTRAN IV and MAP for use on the IBM-7094 computer.

(continued overleaf)

3. Inquiries concerning this program package may be directed to:

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